Objectives

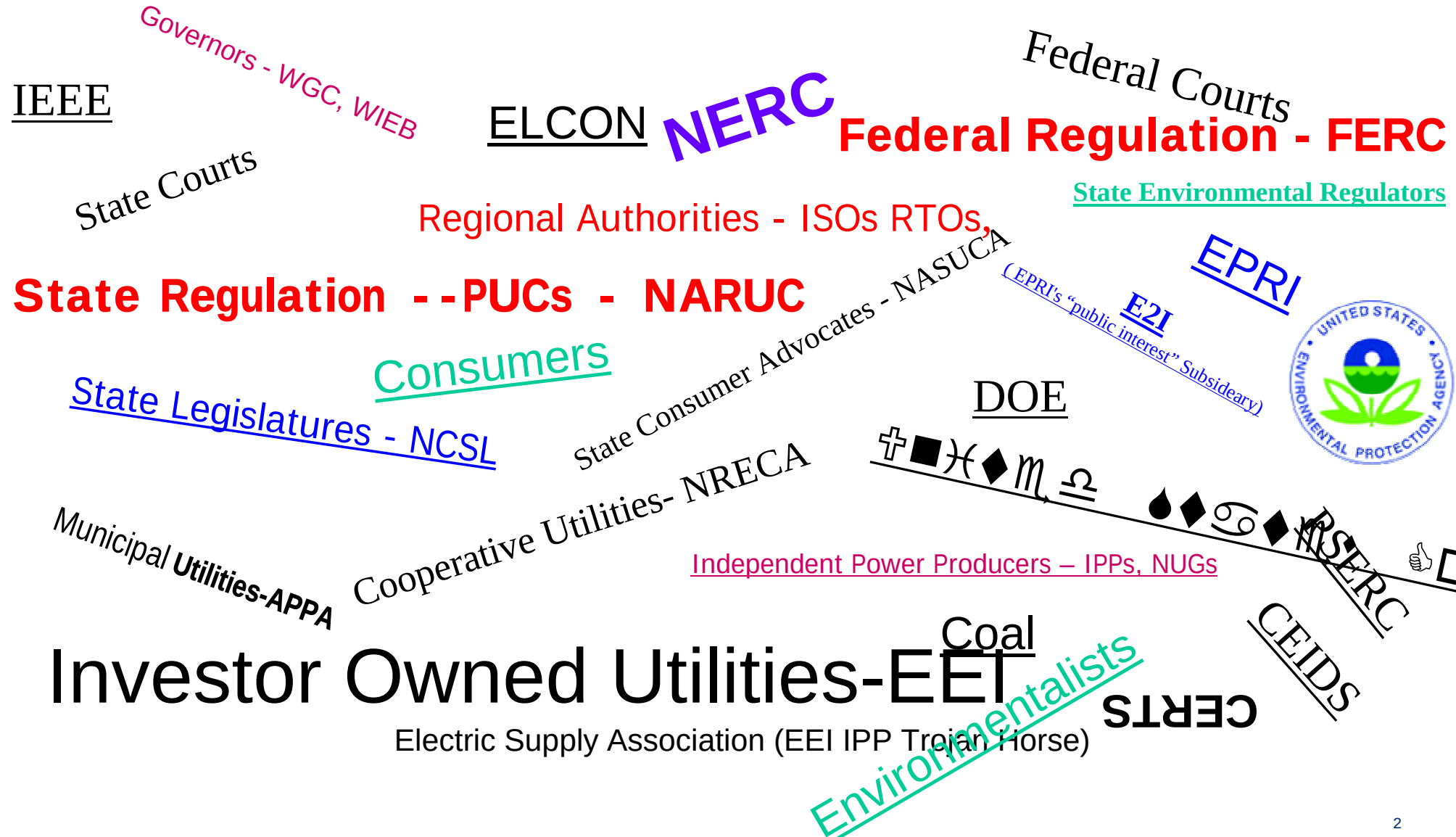
- To ensure the understanding, regulatory adoption, and maximum impact of the ***interconnection and communication and control standards work of the program*** by relevant regulatory and policy institutions

- To identify, analyze, and develop solutions to ***reduce institutional, policy and infrastructure barriers to the development and commercialization of distributed power systems***, and ***the development and deployment of next generation communications and controls and other technical innovations*** developed by the Office of Transmission and Distribution

- To ***provide technical assistance to state and local regulators and other policy makers*** including training, education, workshops, reports and other means to support the most informed analysis and decision making by state and local regulators and policy makers.

- To provide ***relevant input to the Program and Office planning process regarding the current and future needs of the regulatory and policy stakeholder communities*** in order to incorporate such needs and considerations into overall Program and Office Objectives

Regulatory & Institutional Issues
The Landscape



Just what are the problems and needs?

- Situation Analysis:
  - Regulation, Regulators, and regulatory theory are in trouble today
    - Theoretical and Ideological Support has eroded
    - Financial and Political Support has eroded
    - Theoretical underpinnings of regulation always problematic
      - Regulation “lite” was the order of the day until 1970’s
      - “Cost-of-Service” Rate-Based, Rate of Return Regulation Works much better when regulating a single monopoly provider of a single service—dial tone, kWHours, long distance. (Especially with Tech Change for Central Station)
      - Unfortunately, performance based regulation (PBR) rests on COS
      - Technological Deregulation
    - State budgetary cutbacks widespread
    - Loss of institutional knowledge since the 70’s and 80’s
  - Stakeholder workshops have consistently underlined the need for regulatory relief regarding the introduction of innovation and new technologies

Situation Analysis (Cont.)

--from Findings and Conclusions, *DOE's National Electric Vision Document* (July 31, 2003)

Findings:

- **Unprecedented levels of risk and uncertainty about future conditions in the electric industry have raised concerns about the ability of the system to meet future needs. Thousands of megawatts of planned electric capacity additions have been cancelled. Capital investment in new electric transmission and distribution facilities is at an all-time low.**

- **The regulatory framework governing electric power markets – both at the Federal and state levels – is also under stress. Efforts to loosen regulations and unleash competition have generally fallen short of producing their expected results.**

Conclusions:

- **A breakthrough is needed to eliminate the "political log jam" and reduce the risks and uncertainties caused by today's regulatory framework. This includes clarifying intergovernmental jurisdiction, establishing "rules of the road" for workable competitive markets wherever they can be established, ensuring mechanisms for universal service and public purpose programs, and supporting a stable business climate that encourages long-term investment.**

Situation Analysis (Cont.)

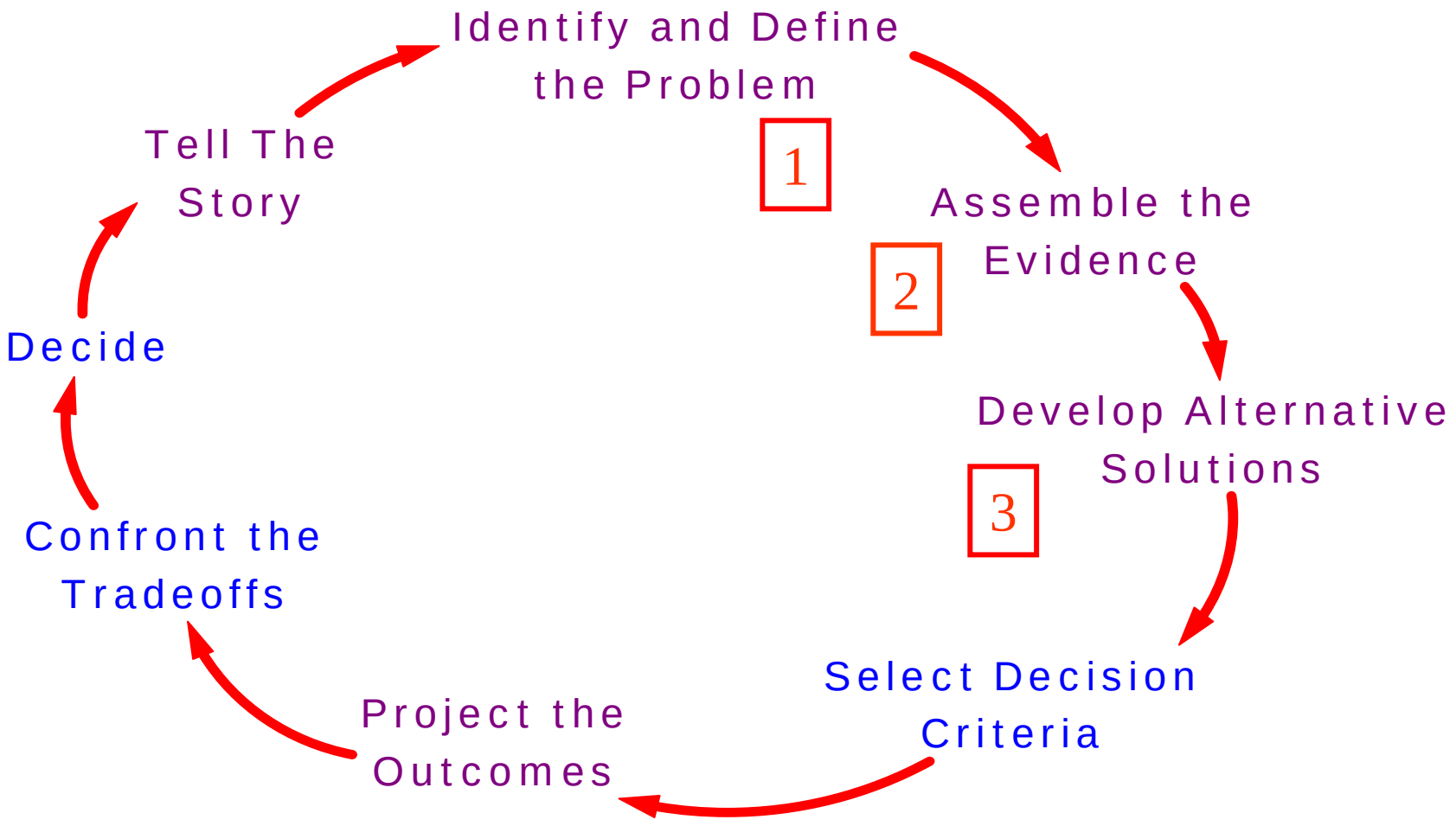
- Example 1: Wholesale/Retail Jurisdiction
  - Consider actually making a “mini-grid” a reality
  - How does the state incorporate the challenge into its body of law, rules and regulations
- Example 2: CHP – the classic lose-lose result of unexamined regulatory principles
  - Static analysis and assumptions rather than dynamic
  - “Preserve the revenue flow”
  - It is the fundamental equation that matters:

    - Revenue Requirement = Return of Rate Base Investment
      + Return On Rate Base Investment
      + Expenses

Technical Approach (cont.)

- The regulatory and institutional issues activity utilizes a staged model of identification, collaborative analysis, and solutions development in achieving its Project Objectives.
- Issues are identified through ongoing collaborations with industry and regulators, and addressed through
  - in-house and subcontract research and consensus building in reducing barriers and developing solutions (studies, etc.) with state and local entities;
  - providing technical assistance to states considering legislation or regulation affecting distributed power; and
  - conducting workshops on understanding, identifying and removing barriers to deployment of distributed power systems.
- **Fantasy Option of More Ability to Be Opportunistic…**

Graphic Outline of Technical Approach



Adopted From Bardach, A Practical Guide for Palicy Analysis: The Eightfold Path to More Effective Problem Solving

Technical Scope What We Are Doing

- Ongoing participation in state, regional, and national conferences relating to the regulatory environment of distributed power systems, and the modernization of the electric industry infrastructure.
  - This participation provides important information regarding issue identification and solution development, along with developing personal relationships and assessments of potential key players in collaborative solution development processes.
  - Investigation and development of future distributed energy resources issues in utility regulation and areas of potential support for NARUC institutional responses, including new committee structure, annual conferences, training programs, etc.
- Continued Development of State Utility Commission Staff and Commissioner Understanding and Proactive Resolution of Challenges Provided by Traditional Regulation to the Commercialization of Distributed Power.
  - This activity has included funding provided to NARUC to develop Model Interconnection Agreement and Procedures, and small subcontracts to utility engineers to develop approaches later utilized in the FERC Small Generation Interconnection Standard process.
- This activity builds on the FY 2002 achievements including:
  - the adoption of the NARUC Resolution Endorsing the Development of Model Interconnection Agreement and Procedures at its February 2002 Winter Meeting,
  - the subsequent development and adoption by NARUC of recommended model interconnection agreement and procedures,
  - and the ongoing use of the knowledge and approach developed both at the state level and in the FERC Small Generator proceedings.

FY03 Progress and Accomplishments
What We Have Done

- **NARUC Support Activities**
  - Resolutions and Issue Identification
  - Support for projects
  - Summer Meetings in Denver, July 2003
  - Introduction of Gridwise concept and progress
- **Issue Awareness Outreach: Presentations and Workshop Participations**
  - DG Evangelist Work at PSERC
  - DOE sponsored meetings and workshops
  - Standing Update at NARUC Meetings, ongoing issue development
  - States of Minnesota, Iowa, Oklahoma DG Regulatory Workshops
  - Primen Annual Outlook, September, 2003
  - January 2003 Program Annual Meeting Agenda including significant recognition of regulatory and institutional issues with keynote by Pat Wood, Chairman, FERC
- **Publications**
  - The Regulatory Assistance Project. "Technical Status Report of the Regulatory Assistance Project: October 2001—February 2003". NREL/SR-560-33167. Golden, Colorado: National Renewable Energy Laboratory. August 2003.
  - Bluestein, J.; Horgan, S.; Eldridge M.M. "Impact of Air Quality Regulations on Distributed Generation". NREL/SR-200-31772. Golden, Colorado: National Renewable Energy Laboratory. October 2002.
  - Public Utility Reports, September 1, 2003, Vol. 141, No. 16, “Combined Heat & Power, Revisited, Outdated “wisdom” wastes the nation’s electricity infrastructure. Distributed CH&P is the answer” Gary Nakarado and Holly Thomas

FY03 Progress and Accomplishments (cont.)

- **Publications (cont.)**
  - “Structural Vulnerability of the United States Power Grid”, Reka Albert, Gary Nakarado, and Istvan Albert, Department of Physics, Pennsylvania State University. (Submitted to Physical Review Oct.2003)
  - The National Association of Regulatory Utility Commissioners. "Model Distributed Generation Interconnection Procedures and Agreement" . Funded by the U.S. Department of Energy's Office of Distributed Energy Resources through the National Renewable Energy Laboratory. July 2002.
  - National Association of Regulatory Utility Commissioners. "Resolution Endorsing the Development of Model Interconnection Agreement and Procedures". February 13, 2002.
  - DER Certification Laboratory Pilot, Accreditation Plan, and Interconnection Agreement Handbook (PDF 65 KB). Presented at the Distribution and Interconnection R&D Annual Review, 2003, in Arlington, Va.
  - “Current Solutions: Recent Experience in Interconnecting Distributed Energy Resources” Matthew Johnson, Sentech Inc., Bethesda, Maryland September 2003, NREL/SR-560-34864

Planned Activities for FY04 (What We Hope to Do)

Development Of Training And Education Workshops And Materials For State Commissions And Commission Staffs To Support State Understanding And Action Toward Modernizing Of The Electricity Infrastructure

- Modular 1-3-5 Day Course On Distribution System Design, Planning, Construction, Operation, and Cost Allocation Methods,
  - Current Sub Contract with the Regulatory Assistance Project (RAP) and Electrotek, working with state commissions and NARUC to develop technical training to state commission staff regarding distribution system engineering issues, including basic planning and engineering issues, role and application of IEEE 1547, development of approaches to cost engineering of distribution systems, and other areas necessary for an informed regulatory environment (RAP Subcontract No. AAD-0-30605-04)

Planned Activities for FY04 (cont.)

- IEEE 1547 Course For Regulatory Staff
  - Objective of introducing the recently approved IEEE 1547 to regulatory staff, including context within ongoing work on additional interconnection and communications and controls standards, applicability and use in addressing state level issues. (To be developed In-House)
- FERC Standardization of Small Generator Interconnection Agreements and Procedures Course For Regulatory Staff
  - Objective of introducing the recently proposed FERC Small Generator Interconnection to regulatory staff, including context within ongoing work on additional interconnection and communications and controls standards, applicability and use in addressing state level issues (To Be Developed In-House upon final adoption)

Planned Activities for FY04 (cont.)

- Regulatory Assistance Program (RAP) – In addition to above, RAP will continue its working with specific state commissions on an as requested basis in supporting the understanding, adaptation, and adoption of the Task's siting and interconnection recommended approaches, the NARUC Model Interconnection Agreement Procedures, and such other areas as individual state utility or environmental regulators may require.

- The Center for the Advancement of Energy Markets (CAEM) - Analysis and Development of Model Options of Electric Utility Rates and Tariffs Affecting DER. This subcontract provides for the following objectives:
  - 1) Analyze existing distribution service rates and tariffs,
  - 2) Develop model DER rate and tariff options, and
  - 3) Presentation of the results to regulatory commissioners and commission staff.
- Opportunistic? `

Outyear Activities

Outyear Activities include

- the completion of the above described contract activities,
- ongoing issue identification and development of additional analysis and recomendations regarding newly identified regulatory barriers affecting the program objectives, and
- ongoing delivery of the information and materials developed to regulators and related stakeholders and policy makers.
- outreach to State Consumer Advocates through NASUCA
- outreach to state legislatures through National Conference of State Legislatures (NCSL)

The technical challenges discussed regarding the need for significant reinvention of the theory and practice of “regulation” for the new environment suggest ongoing opportunities within the Office of Electric Transmission and Distribution and the Electric Distribution Transformation Program

Leverage, Interactions & Collaborations

- National Association of Regulatory Utility Commissioners
- National Association of State Utility Consumer Advocates
- Power Systems Engineering Research Center (PSERC)
- National Council of State Legislatures
- California Energy Commission

- In-House FY04 Milestones

Title	Description	Due Date
In-House Regulatory Work	First Delivery of IEEE 1547 Module	12/31/2003
In-House Regulatory Work	First Delivery of FERC Small Generator Module	3/31/2004
In-House Regulatory Work	Support to other Program activities	As requested, GRIDWISE at NARUC Summer November 2003 and Winter Meetings
RAP	Draft Primer on Distribution System	6/30/2004
CAEM	Draft Report on DG Tariff & Rate Issues	9/30/2004

- Budgets--Overall Stakeholder and Institutional Issues

Cost Element	FY04 ($K)	FY05 ($K)	FY06 ($K)	FY07 ($K)	FY08 ($K)
Labor	283	368	441	486	534
Travel	31	34	38	41	45
Subcontracts	146	219	241	265	291
Other Costs	70	77	85	93	102
TOTAL	**530**	**698**	**805**	**885**	**974**

Contact Information:

National Renewable Energy Laboratory

1617 Cole Blvd, Golden, CO 80401-3393

- Dick DeBlasio — Phone 303-275-4333 – Email deblasid@tcplink.nrel.gov
- Tom Basso — Phone 303-275-3753 – Email thomas_basso@nrel.gov
- Ben Kroposki — Phone 303-275-2979 – Email ben_kroposki@nrel.gov
- Gary Nakarado — Phone 303-275-3719 – Email gary_nakarado@nrel.gov
- Holly Thomas — Phone 303-275-3755 – Email holly_thomas@.nrel.gov